

REVISION OF *BAUHINIA* SUBGENUS *PHANERA*
SECTION *SCHNELLA* (CERCIDEAE: CAESALPINIOIDEAE: FABACEAE)

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ABSTRACT

A taxonomic treatment of *Bauhinia* subgenus *Phanera* section *Schnella* is presented. Eight species are recognized with ***B. lilacina*** Wunderlin & Eilers from Bahia, Brazil and the combination ***B. trichosepala*** (L.P. Queiroz) Wunderlin & Eilers as new. Keys, descriptions, and distribution data are provided.

RESUMEN

Se presenta un tratamiento taxonomico de *Bauhinia* subgénero *Phanera* sección *Schnella*. Se reconocen ocho especies con ***B. lilacina*** Wunderlin & Eilers de Bahia, Brasil y se hace la nueva combinación ***B. trichosepala*** (L.P. Queiroz) Wunderlin & Eilers. Se aportan claves, descripciones, y datos de distribución.

The pantropical genus *Bauhinia* L. (Cercideae: Caesalpinioideae: Fabaceae) with approximately 330 species consists of four subgenera: *Bauhinia* L., *Piliostigma* (Hochst.) Kurz [= *Elayuna* (Raf.) Wunderlin], *Barklya* (F. Muell.), and *Phanera* (Lour.) Wunderlin (Wunderlin et al. 1987). *Bauhinia* subgenus *Phanera*, as defined by Wunderlin et al. (1987), is a pantropical group consisting primarily of tendriled lianas in 11 sections, of which two, *Schnella* and *Caulotretus*, are confined to the New World tropics. The other nine sections are Old World. Section *Schnella* is distinguished from *Caulotretus* by its five-nerved or inconspicuously nerved calyx, an indehiscent or tardily dehiscent, thin-valved fruit, the stigma usually peltate or capitate, and the pollen sexine with conspicuous supracteal processes. In contrast, *Caulotretus* has a conspicuously 10- or 15-nerved calyx, a dehiscent, usually woody fruit, the stigma usually oblique, and the pollen sexine merely rugulose or perforate. *Bauhinia herrerae* (Britton & Rose) Standl. & Steyerl., a species placed in section *Caulotretus* by Wunderlin et al. (1987) differs in several characters which otherwise distinguish the two sections by having a peltate stigma and an indehiscent, thin-valved fruit as found in section *Schnella*, but has the distinctive calyx and pollen characters that clearly place it in section *Caulotretus*.

Recent molecular data based on ITS sequences of nuclear ribosomal DNA (Hao et al. 2003) suggests that subgenus *Phanera* is polyphyletic and that the New World *Phanera* forms a clade distinct from the rest of subgenus *Phanera* in the Old World. Recently Lewis and Forest (2005) recognized *Barklya* F. Muell., *Gigasiphon* Drake, *Lasiobema* (Korth.) Miguel, *Phanera* Lour., *Piliostigma* Hochst., and *Tylosema* (Schweinf.) Torre & Hillc. as genera distinct from *Bauhinia*. However, that classification is only partly supported by molecular data (Lewis & Forest 2005). Since further study is needed to resolve this issue, it seems best at this time to recognize *Bauhinia* s.l. rather than several segregate genera.

Two groups within section *Schnella* can be distinguished, although they are not formally recognized here. *Bauhinia lilacina*, *B. radiata*, and *B. trichosepala* differ from the others in characters of the calyx and pollen morphology. The calyx of these species is prominently 5-nerved and the pollen with the supracteal processes aligned on ridges along the colpi margins. The second group consists of *B. flexuosa*, *B. maximiliani*, *B. microstachya*, *B. poiteauana*, and *B. smilacina*. They have an inconspicuously 5-nerved calyx and the pollen with the supracteal processes subequally disposed on the tectum between the colpi and with no prominent ridges along the colpi margins.

Bauhinia L. subg. **Phanera** (Lour.) Kurz sect. **Schnella** (Raddi) Benth., in Benth. & Hook. f., Gen. Pl. 1:576. 1865. *Schnella* Raddi, Quar. Piant. Nuov. Bras. 32. 1820. *Bauhinia* section *Schnella* (Raddi) Benth. TYPE: *Schnella macrostachya* Raddi [= *Bauhinia radiata* Vell.]. Lectotype designated by Britton and Rose (1930).

Caulotretus Rich. ex Schott, in Sprengel, Syst. Veg. 4(2):406. 1827. *Caulotretus* sect. *Eucaulotretus* Endlicher, Gen. Pl. 1317. 1840, nom. inadmiss. TYPE: *Caulotretus smilacinus* Schott [= *Bauhinia smilacina* (Schott) Steud.].

Woody vines with woody, nodal tendrils. Leaves petiolate, with minute intrastipular trichomes, the blade entire or bilobate, the midrib with weak to moderately developed secondary veins, the stipules linear-lanceolate, caducous. Inflorescences terminal or subterminal and axillary, spiciform racemes, these often paniculiform through reduction of the leaves. Flowers with the hypanthium turbinate, nectariferous disc absent; calyx cupulate or campanulate, either conspicuously 5-nerved with the nerves extending beyond the lobe apex as a short mucro or as a setaceous projection, or inconspicuously 5-nerved and with the nerves not extending beyond the lobe apex, the calyx at anthesis either splitting irregularly into 2–3 lobes as the expanding petals force the calyx to rupture or expanding into 5 lobes, nectariferous; petals 5, clawed, subequal; stamens 10, free, all fertile, in two ranks with the alternate ones (inner whorl) slightly shorter, the filaments slightly upward curved, the anthers oblong, opening by longitudinal slits; pollen spheroid, 3-colporate, with the tectum granular or microrugulate, often microperforate, with spheroid suprategal processes; ovary with a short gynophore free from the hypanthium, the style terminated by a small, peltate, and asymmetric stigma. Fruit thin-valved, samaroid, indehiscent or tardily dehiscent, with the calyx persistent; seeds 1(2), with 2 short, funicular, aril-lobes.

1. Leaves of flowering or fruiting stems entire, (3–)5(–7)-nerved.
 2. Fruit narrowly elliptic (at least 4 times as long as wide), 6.5–7 cm long, chartaceous _____ **B. smilacina**
 2. Fruit elliptic-reniform (2 times as long as wide), 3–6 cm long, subcoriaceous.
 3. Flower buds ca. 3 mm long; fruit 2.5–3.5 cm long _____ **B. poiteauana**
 3. Flower buds 4–5 mm long; fruit 4.5–6 cm long _____ **B. maximiliani**
1. Leaves of flowering or fruiting stems bilobate, 7- to 9-nerved.
 4. Calyx inconspicuously 5-nerved, the nerves not extending beyond the apex; flower buds 2–5 mm long.
 5. Branches conspicuously flexuous; leaves (1.5–)2.5–3.5 cm long; petals glabrous; fruit 2.5–3 cm long _____ **B. flexuosa**
 5. Branches not flexuous; leaves (4–)7–8(–10) cm long; petals strigose along the median nerve on the outer surface; fruit 4–7 cm long _____ **B. microstachya**
 4. Calyx conspicuously 5-nerved, the nerves extending beyond the apex as a mucro or a setaceous projection; flower buds 6–15 mm long.
 6. Petals white; leaves 9–11 cm long _____ **B. radiata**
 6. Petals pink or lilac; leaves 4–8 cm long.
 7. Calyx nerves undulate, winged toward the apex, extending 3–5 mm beyond the apex _____ **B. trichosepala**
 7. Calyx nerves not undulate nor winged, extending no more than 0.5 mm beyond the apex _____ **B. lilacina**

Bauhinia flexuosa Moric., Pl. Nouv. Amer. 80, t. 53. 1840. *Schnella flexuosa* (Moric.) Walp., Repert. Bot. Syst. 5:572. 1846. *Phanera flexuosa* (Moric.) L.P. Queiroz, Neodivers. 1:6. 2006. TYPE: BRAZIL. BAHIA: along the Rio São Francisco, Serra Açurua, 1838, *Blanchet* 2853 (LECTOTYPE, here designated; selected from among three sheets at G studied by Moricand: G!; ISOTYPES: BM!, G!, K!, NY!, P!; photo ex K: US!).

Woody, tendriled vine climbing to 5 m; young branches subterete, flexuous, strigose, becoming glabrate in age, with conspicuous lenticels, the older stems flattened. Leaves with the blade bilobed 1/8–1/3 the length, suborbicular, (1.5–)2.5–3.5 cm long, (1.5–)2–4.5 cm wide, 7-nerved, chartaceous, the lobes parallel or slightly divergent, the lobe apex rounded, the blade base rounded to cordate, the upper surface glabrous or glabrate, the lower surface sparsely strigose or hirsute, especially along the veins, glaucous, the petiole 1–1.5 cm long, loosely strigose, the stipules ovate-lanceolate, ca. 0.5 mm long, strigose. Inflorescence terminal or subterminal and axillary, in short, dense, spiciform racemes, sometimes paniculiform, 2–10 cm long, densely red-brown strigose; buds subglobose, 2–3 mm long and wide, densely red-brown strigose, the pedicel 1.5–2 mm long, the bract and bracteoles lanceolate, ca. 0.5 mm long; hypanthium depressed-cupulate, ca. 1 mm long, the inner surface glabrous; calyx cupulate, 2–3 mm long, inconspicuously 5-nerved, the nerves not

extending beyond the apex, 2- to 5-lobed, the lobes triangular-ovate, the inner surface sparsely red-brown strigose; petals white, broadly spatulate, 6–7 mm long, ca. 4–5 mm wide, the claw 1–1.5 mm long, glabrous, the blade concave, the apex rounded, glabrous; stamens 3–5 mm long, the filament 3–4 mm long, glabrous, the anther oblong, ca. 1 mm long, glabrous; pollen spheroid, 3-colporate, the tectum microrugulate, often microperforate, with depressed, spheroid suprategal processes; gynoecium ca. 5 mm long, the gynophore ca. 1 mm long, red-brown short-hirsute, the ovary 2.5–3 mm long, red-brown short-hirsute, the style ca. 1.5 mm long, glabrous. Fruit elliptic-reniform, 2.5–3 cm long, 1.2–1.4 cm wide, the apex apiculate with the persistent, somewhat oblique style or style base, the valves chartaceous, reticulate, light brown or reddish brown strigose, especially on the margin, 1-seeded, the gynophore 3–4 mm long, densely red-brown strigose; seeds suborbicular to broadly reniform, ca. 9 mm long, ca. 11 mm wide, ca. 1 mm thick.

Distribution and ecology.—Brazil (Bahia and Minas Gerais). In Caatinga and seasonally dry forests at ca. 450 m. Flowering and fruiting in April.

This rare species is most closely related to *B. microstachya* but is distinguished by its smaller leaves (1.5–)2.5–3.5 cm long vs. (4–)7–8(–10) cm long), its smaller fruit (2.5–3 cm long vs. 4–7 cm long), and by its conspicuously flexuous stems.

Specimens examined: **BRAZIL. Bahia:** basin of the upper Rio São Francisco, ca. 35 km N of Bom Jesus de Lapa on the main road to Ibotirama, ca. 450 m, 19 Apr 1980, *Harley et al.* 21551 (K, MEXU). **Minas Gerais:** between Inficionado and Caraça, 12 Apr 1882, *Glaziou* 12622 (G, K, P); between Inficionado and Caraça, s.d., *Glaziou* 13739 (P); between Inficionado and Caraça, 1883, *Glaziou* 13740 (G, K, P).

Bauhinia lilacina Wunderlin & Eilers, sp. nov. (**Fig. 1**). TYPE: BRAZIL. BAHIA: Km 5 on Núcleo Colonial de Una-São José Highway (BR 101), 4 Aug 1977, *Silva Mattos & Hage* 81 (HOLOTYPE: CEPEC!; ISOTYPES: K!, US!).

Differt a *Bauhinia radiata* Vell. petalis lilacinis, florum bracteis et bracteolis triangularibus brevioribus inconspicuis, stylis dense rubrotomentosis.

Woody, tendriled vine climbing to 4 m; young branches subterete, densely red-brown tomentose, becoming sparsely so in age, with conspicuous lenticels, the older stems flattened, sometimes perforate. Leaves with the blade bilobed 1/3 the length, suborbicular, ca. 6.3 cm long, ca. 7 cm wide, 9-nerved, subcoriaceous, the lobes slightly divergent, the lobe apex rounded, the blade base cordate, the upper surface sparsely white-pilose, the lower surface red-brown tomentose, especially on the veins, the petiole ca. 2.6 cm long, red-brown tomentose, the stipules lanceolate, 2 mm long, red-brown tomentose. Inflorescence terminal or subterminal and axillary, in spiciform racemes, 10–14 cm long, red-brown tomentose; buds broadly elliptic, 6–7.5 mm long, 4–6 mm wide, red-brown tomentose, with 5 mucronate nerve tips extending ca. 0.5 mm beyond the apex, the pedicel ca. 1 mm long, the bract and bracteoles linear-lanceolate, 2–2.5 mm long; hypanthium cupulate, ca. 2 mm long, the inner surface glabrous; calyx campanulate, ca. 4 mm long, conspicuously 5-nerved, the nerves usually extending ca. 0.5 mm beyond the apex, irregularly splitting into 5 lobes, the lobes triangular, the inner surface red-brown strigose; petals lilac-colored, spatulate, 13–15 mm long, 4–6 mm wide, the claw 1 mm long, glabrous, the blade concave, the apex emarginate, with a tuft of trichomes at the apex and scattered trichomes near the base; stamens 10–12 mm long, the filament 7–9 mm long, glabrous, the anther oblong, ca. 3 mm long, glabrous; pollen spheroid, 3-colporate, the tectum microrugulate, with suprategal processes along the marginal ridges of the colpi; gynoecium ca. 11 mm long, the gynophore 1–2 mm long, densely red-brown tomentose, the ovary ca. 4.5 mm long, densely red-brown tomentose, the style 4–4.5 mm long, densely red-brown tomentose except near the stigma. Fruit not seen.

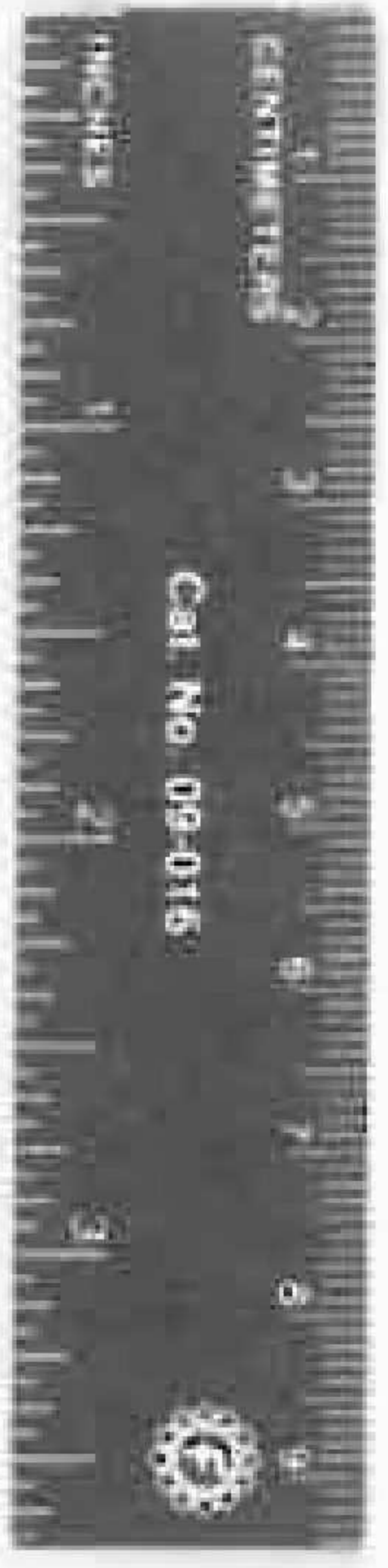
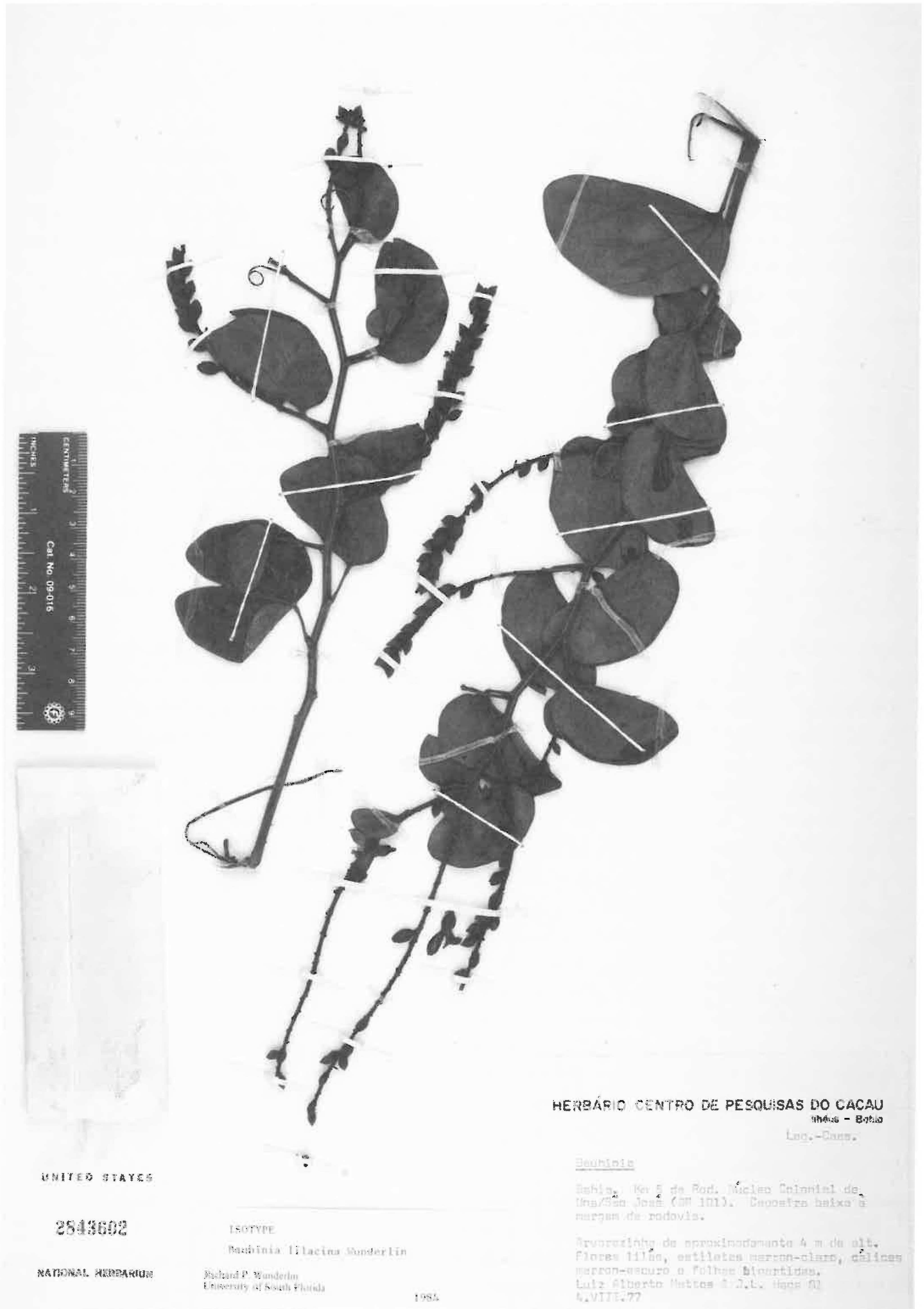
PARATYPE: **BRAZIL. Bahia:** without specific locality, s.d., *Belém* 3675 (CEPEC!).

Etymology.—The specific epithet is in reference to the lilac-colored petals.

Distribution and ecology.—Brazil (Bahia). In secondary forest. Flowering in August.

This distinctive species is one of two species of section *Schnella* in Bahia with colored petals. It is distinguished from *B. trichosepala*, the other species with pink- or lilac-colored petals, by its smaller petals (13–15 mm long vs. 25–30 mm long), its sepals not elongated into setaceous tips, and its tomentose style.

Bauhinia maximiliani Benth., in Martius, Fl. Bras. 15(2):207. 1870. *Binaria maximiliani* (Benth.) A. Schmitz, Bull.



UNITED STATES

2843602

NATIONAL HERBARIUM

ISOTYPE
Bauhinia lilicina Wunderlin

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1985

HERBÁRIO CENTRO DE PESQUISAS DO CACAU
Itapúa - Bahia
Luz.-Cass.

Bauhinia

Bahia, Km 5 da Rod. Nucleo Colonial de
Itap/Sea João (CN 101). Capoteira baixa e
margem de rodovia.

Aproximadamente 4 m de alt.
Flores lilás, estiletos marrom-claro, cálices
marrom-escuro e folhas bicoloradas.
Luiz Alberto Mattos s. J. L. 1985 02
4.VITE277

Fig. 1. *Bauhinia lilicina* (isotype, US).

Jard. Bot. Natl. Belg. 43(3-4):404. 1973. TYPE: BRAZIL. ESPÍRITO SANTO: Villa Nova de Almeida, s.d., *Wied-Neuwied* s.n. (HOLOTYPE: BR; ISOTYPE: M; photo ex M: RB!).

Woody, tendriled vine; young branches subterete, red-brown strigose, soon becoming glabrate, the older stems flattened, undulate, sometimes becoming perforate. Leaves with the blade entire, elliptic to broadly lanceolate, 6–12 cm long, 3–6.5 cm wide, (3-)5-nerved, chartaceous to subcoriaceous, the apex obtuse to acuminate, the base cuneate to subcordate, the upper surface glabrous, the lower surface sparsely short-hirsute to glabrous, lighter in color than the upper surface, the petiole 0.5–1 cm long, sparsely short-hirsute or tomentellous to glabrate, the stipules ovate-lanceolate, ca. 1 mm long, tomentellous. Inflorescence terminal or subterminal and axillary, in spiciform racemes, often paniculiform, 10–25 cm long, densely red-brown strigose; buds subglobose, 4–5 mm long and wide, densely red-brown strigose, the pedicel ca. 1 mm long, the bract and bracteoles ovate-lanceolate, 0.5–1 mm long; hypanthium depressed-cupulate, ca. 1 mm long, the inner surface glabrous; calyx cupulate, 3–4 mm long, inconspicuously 5-nerved, the nerves not extending beyond the apex, (2-)3-lobed to about the middle, the lobes triangular-ovate, the inner surface sparsely brown-strigose; petals white, spatulate, 4.5–6 mm long, 3.5–4 mm wide, the claw 1–1.5 mm long, glabrous, the blade slightly concave, the apex rounded, sparsely red-brown strigose on the outer surface or glabrous; stamens 4–6 mm long, the filament 4–5 mm long, glabrous, the anther oblong, ca. 1.5 mm long, glabrous; pollen not seen; gynoecium ca. 5 mm long, the gynophore 2–3 mm long, red-brown short-hirsute to tomentose, the ovary 2.5–3.5 mm long, red-brown, short-hirsute, the style ca. 1.5 mm long, glabrous. Fruit (immature ?) elliptic-reniform, 4.5–6 cm long, 3.5–4.5 cm wide, the apex apiculate with the persistent, oblique, style base, the valves subcoriaceous, inconspicuously reticulate, red-brown strigose, 1-seeded, the gynophore 4–7 mm long, red-brown strigose; seeds not seen.

Distribution and ecology.—BRAZIL (Rio de Janeiro, Bahia, and Espírito Santo). In wet forest. Fruiting in June and July.

Originally described from flowering material and presently represented by only a few mainly fructiferous specimens, *B. maximiliani* is still poorly known. It resembles *B. poiteauana* and *B. smilacina* by its entire leaves and small, white flowers. It differs from *B. poiteauana* by its larger fruit (4.5–6 vs. 3.5–4.5 cm long), though similarly reniform, and from *B. smilacina* by its distinctive reniform fruit (vs. narrowly elliptic in *B. smilacina*). Fruiting material from Rio de Janeiro reported as *B. smilacina* by Vaz (1989) is placed here.

Specimens examined: **BRAZIL. Bahia:** along highway from Camacan to Itabuna, 29 Jul 1965, *Belém* 1409 (CEPEC, IAN, NY, US); Rio Gongogi Basin, 100–500 m, 1 Oct–30 Nov 1915, *Curran* 174 (US); between Camaça and Itabuna, 29 Jul 1965, *Lanna Sobriho* 972 (US); along road between São José da Capelinha and Una, at Km 17 on BR 101, ca. 45 km S of Itabuna, 2 Jun 1979, *Mori* 11897 (CEPEC, K, US); between Una and Rio Branco, 16 Jun 1971, *Pinheiro* 1363 (CEPEC, K, US); Km 27 on São José highway (junction of BR 101), Una, near Fazenda Piedade, 20 Jul 1981, *Silva et al.* 1296 (CEPEC, K). **Rio de Janeiro:** Serra da Estrella, 2 May 1880, *Glaziou* 11912 (G, K, P).

Bauhinia microstachya (Raddi) J.F. Macbr., *Contr. Gray Herb.* 59:22. 1919. *Schnella microstachya* Raddi, *Mem. Mat. Fis. Soc. Ital. Sci. Modena*, Pt. Mem. Fis. 18:418. 1820. *Phanera microstachya* (Raddi) L.P. Queiroz, *Neodivers.* 1:6. 2006. TYPE: BRAZIL. RIO DE JANEIRO: *Raddi* s.n. (HOLOTYPE: FI).

Bauhinia tomentosa Vell., *Fl. Flumin.* 171. 1829 («1825»); non L., 1753. TYPE: BRAZIL. RIO DE JANEIRO: [LECTOTYPE, here designated: Vellozo, *Fl. Flumin.*, Icon. 4:t. 84. 1831 («1827»)].

Bauhinia langsdorffiana Bong., *Mém. Acad. Imp. Sci. St.-Petersbourg*, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 4:109. 1838. TYPE: BRAZIL. RIO DE JANEIRO: near Maje, 1823, *Riedel* s.n. (HOLOTYPE: LE; ISOTYPES: G!, P!).

Bauhinia bahiensis Bong., *Mém. Acad. Imp. Sci. St.-Petersbourg*, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 4:114. 1838. *Bauhinia langsdorffiana* var. *bahiensis* (Bong.) Benth., in Martius, *Fl. Bras.* 15(2):204. 1870. *Bauhinia microstachya* (Raddi) J.F. Macbr. var. *bahiensis* (Bong.) J.F. Macbr., *Contr. Gray Herb.* 59:22. 1919. *Schnella microstachya* Raddi var. *bahiensis* (Bong.) A. Schmitz, *Bull. Jard. Bot. Natl. Belg.* 43:402. 1973. TYPE: BRAZIL. BAHIA: (LECB?).

Bauhinia spicata Vogel, *Linnaea* 13:310. 1839; non Rottler ex Sprengel, 1807; nec König ex Wallich, 1831. *Bauhinia vogeliana* Steud., *Nomencl. Bot.*, ed. 2. 1:192. 1840. *Schnella spicata* A. Schmitz, *Bull. Jard. Bot. Natl. Belg.* 43:402. 1973, nom. illegit. TYPE: BRAZIL: *Sello* s.n. (HOLOTYPE: B, destroyed; LECTOTYPE, here designated: K!; ISOTYPES: G!, P!; photo ex B: US!; photo ex K: US!).

Bauhinia polyantha Vogel, *Linnaea* 13:310. 1839. TYPE: BRAZIL. RIO DE JANEIRO: near Rio de Janeiro, s.d., *Richard* s.n. (HOLOTYPE: B, destroyed).

Bauhinia lagesiana Harms, *Verh. Bot. Vereins Prov. Brandenburg* 48:165. 1907. TYPE: BRAZIL. AMAZONAS: near Juruá, May 1901, *Ule* 5481 (HOLOTYPE: B, destroyed).

Bauhinia gentlei Lundell, *Wrightia* 3:120. 1965. TYPE: BELIZE. TOLEDO DISTRICT: between Condemn Branch Pine Ridge and Moffredye Lagoon, in cohune ridge, 15 Sep 1946, *Gentle 6047* (HOLOTYPE: LL!; ISOTYPE: MO!).

Bauhinia microstachya (Raddi) J.F. Macbr. var. *massambabensis* Vaz, *Pesquisas, Bot.* 44:100. 1993. TYPE: BRAZIL. RIO DE JANEIRO: Massambaba, 18 Jun 1987, *M. Gomes 201* (HOLOTYPE: RB).

Woody, tendriled vine climbing to 20 m or more; young branches subterete, densely red-brown strigose, soon becoming glabrous, with somewhat conspicuous lenticels, the older branches flattened, with the center undulate and sometimes perforate. Leaves with the blade bilobed 1/8–7/8 the length, suborbicular to ovate, (4–)7–8(–10) cm long, (4.6–)5–6(8) cm wide, 9-nerved, chartaceous to coriaceous, the lobes parallel to widely divergent, the lobe apex rounded, acute, or acuminate, the blade base cordate to rounded, the upper surface with a few scattered white to tan trichomes or glabrous, the lower surface red-brown tomentose, especially when young, the petiole (0.8–)1–3(–5.8) cm long, red-brown tomentose, the stipules lanceolate, ca. 3 mm long, red-brown tomentose. Inflorescence terminal or subterminal and axillary, in dense, spiciform racemes, often paniculiform, 10–23 cm long, densely red-brown tomentose; buds subglobose, slightly asymmetric, ca. 5 mm long and wide, red-brown tomentose, the pedicel ca. 0.5 mm long, the bract and bracteoles triangular, ca. 1 mm long, ca. 0.5 mm wide; hypanthium shallowly cupulate, ca. 1 mm long, the inner surface glabrous or with a few trichomes at the base of the gynophore; calyx campanulate, ca. 5 mm long, inconspicuously 5-nerved, the nerves not extending beyond the apex, (2)3-lobed, the lobes triangular, the inner surface with short, appressed trichomes; petals white, spatulate, 5–7 mm long, 2.5–4 mm wide, the claw ca. 2 mm long, red-brown strigose, the blade slightly concave, the apex rounded to obtuse, usually red-brown strigose along the median nerve on the outer surface,; stamens 7–10 mm long, the filament 6–8 mm long, glabrous, the anther oblong, ca. 2 mm long, glabrous; pollen spheroid, 3-colporate, the tectum microrugulate, often microperforate, with spheroid, supracteal processes; gynoecium 4.5–5 mm long, the gynophore to ca. 0.5 mm long, sparsely red-brown tomentose, the ovary ca. 2 mm long, densely red-brown tomentose, the style ca. 2 mm long, sparsely red-brown tomentose. Fruit elongate-reniform, (4–)5–7 cm long, 1.1–1.8 cm wide, the apex and base acute to rounded, the valves chartaceous, conspicuously reticulate, sparsely to densely red-brown or sometimes red-tomentose, particularly on the margins, 1(2)-seeded, the gynophore 2–5 mm long, red-brown strigose; seeds elliptic-reniform, 18–20 mm long, 8–10 mm wide, ca. 1 mm thick.

Distribution and ecology.—Mexico, Guatemala, Belize, Panama, Venezuela, Bolivia, Peru, Paraguay, and Brazil. In wet to moist high forest at 0–1,200 m. Flowering March to September; fruiting January to November.

Although several segregates at the species or varietal level have been proposed by previous workers, *B. microstachya* is treated here as a single, wide-ranging, polymorphic species. It is most closely related to *B. flexuosa* of the caatinga of Bahia and Minas Gerais, Brazil, but is distinguished from that species by its larger leaves (4–9 cm long vs. 1.5–3.5 cm long), its larger fruit ((4–)7–8(10) cm long vs. 2.5–3 cm long), and its lack of conspicuously flexuous stems.

Representative specimens examined. **MEXICO. Chiapas:** Lacanja-Chansayab, road from Palenque to the mouth of Lake Lacantún, 340 m, 7 Nov 1985, *Martínez 15072* (WIS). **Oaxaca:** Cerro Buenos Aires, W side of the Temazcal Dam (Miquel Aleman), 60 m, 6 Mar 1986, *Cortés et al. 182* (MEXU); 500 m SE of the spillway of the Temazcal Dam, 70 m, 24 Nov 1986, *Cortés et al. 573* (MEXU). **Veracruz:** along road 5.5 km E of Tebanca (5.5 km E of east side of Lago Catemaco), 800 m, 5 Jul 1980, *Nee & Hansen 18853* (F, USF). **GUATEMALA. El Petén:** Km 72 of Poptun-Santa Elena Road, in high forest, 24 Oct 1966, *Contreras 6495* (US). **PANAMA. Darién:** Río Cerro Yaviza, near Yaviza, near sea level, s.d., *Duke & Bristan 422* (MO, NY, US). **VENEZUELA. Amazonas:** Río Ocamo area, between the Yanomani, 5 Oct 1978, *Fuentes 1103* (US). **Miranda:** Cerros del Bachiller, near east end, between Quebrada Corozal and Quebrada Santa Cruz, S of Santa Cruz, 18–20 m, 18–19 Mar 1978, *Steyermark & Davidse 116484* (MO, USF). **PERU. Loreto:** Florida, Río Putumayo, at mouth of Río Zubineta, ca. 200 m, Mar–Apr 1931, *Klug 2067* (BM, K, US). **Madre de Dios:** edge of Cocha Cashu, ox-bow lake of Río Manu, Parque Nacional del Manu, 12 Aug 1973, *Foster 2571* (K, US). **San Martín:** Chazuta, Río Huallaga, ca. 260 m, Apr 1935, *Klug 4060* (BM, US). **BRAZIL. Amazonas:** along the Rio Amazon, mouth of the Rio Solimões, May 1851, *Spruce 1522* (G, K, P). **Bahia:** ca. 28 km N of Seabra, road to Agua de Rega, ca. 1,000 m, 27 Feb 1971, *Irwin et al. 31164* (K, US). **Espírito Santo:** Refúgio Biológico Sooretama, 9–10 Aug 1965, *Lanna Sobriho 4598* (USF). **Minas Gerais:** State Agricultural School, Viçosa, 6 Nov 1958, *Irwin 2029* (NY). **Paraná:** Rio do Cedro, 7 Mar 1968, *Hatschbach 18664* (US, USF). **Rio de Janeiro:** Jurujuaba, 19 Nov 1873, *Glaziou 6841* (K, P). **Santa Catarina:** Pinheiral, S of São Miguel d'Oeste, 600–700 m, 23 Feb 1957, *Smith & Klein 11715* (G, K, P, US). **BOLIVIA. La Paz:** Guanay, ca. 600 m, May 1886, *Rusby 952* (BM, K, US). **PARAGUAY. San Pedro:** in region of the Río Alto Paraná, 1909–1910, *Fiebrig 6201* (G, K, US).

Bauhinia poiteauana Vogel, *Linnaea* 13:309. 1839. TYPE: FRENCH GUIANA. 1844, *Poiteau s.n.* (HOLOTYPE: B, destroyed; LECTOTYPE, here designated: K!; photo ex B: US!; photo ex K: US!).

Woody, tendriled vine climbing to 25 m; young branches subterete, red-brown strigose or puberulent, soon becoming glabrate, with "conspicuous lenticels, the older stems flattened, undulate, sometimes becoming perforate with age. Leaves with the blade entire, elliptic to broadly lanceolate, 8–12 cm long, 3.5–6 cm wide, 3- to 5-nerved, subcoriaceous, the apex acuminate, the base rounded to subcordate, the upper surface glabrous, the lower surface with scattered erect or appressed trichomes, the petiole 7–10 mm long, red-brown tomentellous, the stipules ovate, ca. 1 mm long, red-brown tomentellous. Inflorescence terminal or subterminal and axillary, in spiciform racemes, sometimes paniculiform, 11–12(–25) cm long, red-brown tomentellous; buds subglobose, ca. 3 mm long and wide, red-brown tomentellous, the pedicel ca. 1 mm long, the bract and bracteoles triangular-lanceolate, ca. 0.5 mm long; hypanthium depressed-cupulate, ca. 1 mm long, the inner surface sparsely appressed red-brown strigose apically; calyx campanulate, 3–4 mm long, inconspicuously 5-nerved, the nerves not extending beyond the apex, 3-lobed, the lobes triangular, the inner surface sparsely red-brown strigose; petals white, broadly spatulate, 4–6 mm long, 3–4 mm wide, the claw ca. 1 mm long, sparsely red-brown strigose on the inner surface, the blade concave, the apex rounded, sparsely red-brown pilose on the outer surface near the apex and on the inner surface near the base; stamens 6–8 mm long, the filament 5–6 mm long, glabrous, the anther oblong, ca. 2 mm long, glabrous; pollen spheroid, 3-colporate, the tectum microrugulate, often microperforate, with spheroid, suprategal processes; gynoecium 4–5 mm long, the gynophore to 0.5 mm long, densely red-brown hirsute, the ovary ca. 1 mm long, densely red-brown hirsute, the style 2–3 mm long, glabrous. Fruit elliptic-reniform, 2.5–3.5 cm long, 1.5–1.7 cm wide, the apex obliquely apiculate with the persistent style base, the valves subcoriaceous, inconspicuously reticulate, reddish, sparsely red-brown strigose, 1-seeded, the gynophore ca. 2 mm long, red-brown tomentose distally; seeds suborbicular, ca. 10 mm long, ca. 9 mm wide, ca. 1 mm thick.

Distribution and ecology.—French Guiana and Brazil (Amapá). In moist to wet forests at 0–200 m. Flowering October to December; fruiting in January and February.

This species is distinguished from the other entire-leaved species, *B. maximiliani* and *B. smilacina*, by its smaller fruits.

Specimens examined. **FRENCH GUIANA.** Cayenne, s.d., *Martin s.n.* (BM, K, P); Approuague, along the bank upstream on the Crique Tortue, 25 Jan 1967, *Oldeman 2320* (US); Camopi River, between Roche Habillée des Dames and Saut Chien, 5 Dec 1967, *Oldeman 2547* (P, US); bank of the Camopi River (tributary of l'Oyapock River), near Saut Tampac, 6 Dec 1967, *Oldeman 2567* (US); bank of the Crique Inipi 3 km from the Camopi River, 7 Feb 1968, *Oldeman & Sastre 71* (US); Cayenne, s.d., *Perrottet s.n.* (P). Without precise locality: 1838, *Leprieur 348* (P); s.d., *Leprieur s.n.* (P); 1820, *Perrottet 188* (G); 1821, *Perrottet 196* (G). **BRAZIL. Amapá:** along the Rio Oiapoque, 4 Feb 1950, *Frões 25839* (P); upper slopes and summit of Mt. Tipac, 200–250 m, 15 Oct 1960, *Irwin 48740* (K, US).

Bauhinia radiata Vell., *Fl. Flumin.* 170; 4: pl. 81. 1829 ("1825"). TYPE: BRAZIL: (lost).

Bauhinia acuminata Vell., *Fl. Flumin.* 171. 1829 ("1825"); non L., 1753. TYPE: BRAZIL. RIO DE JANEIRO: Rio Taguaí (lost).

Bauhinia raddiana Bong., *Mém. Acad. Imp. Sci. St.-Petersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat.* 4:111. 1838. TYPE: BRAZIL (LECB?).

Schnella macrostachya Raddi, *Mem. Reale Accad. Sci. Modena* 18: Fis. 411. 1820. TYPE: BRAZIL: without precise location: s.d., *Raddi s.n.* (HOLOTYPE: FI; ISOTYPE: G!).

Bauhinia verrucosa Vogel, *Linnaea* 13:311. 1839. TYPE: BRAZIL. RIO DE JANEIRO: between Rio de Janeiro and Cabo Frio, *Sello s.n.* (HOLOTYPE: B, destroyed).

Bauhinia raddiana Bong. var. *brachystachya* Benth., in Martius, *Fl. Bras.* 15(2):203. 1870. *Schnella macrostachya* Raddi var. *brachystachya* (Benth.) A. Schmitz, *Bull. Jard. Bot. Natl. Belg.* 43:402. 1973. TYPE: BRAZIL. RIO DE JANEIRO: base of Monte Corcovado, May 1839, *Guillemin 706* (HOLOTYPE: K!; ISOTYPES: G!, P!).

Bauhinia leiopetala Benth., in Martius, *Fl. Bras.* 15(2):209. 1870. *Binaria leiopetala* (Benth.) A. Schmitz, *Bull. Jard. Bot. Natl. Belg.* 43:406. 1973. TYPE: BRAZIL. MINAS GERAIS: near Lagoa Santa on the Rio das Velhas, s.d., *Warming [301]* (HOLOTYPE: K; ISOTYPE: P!).

Woody, tendriled vine climbing to 8 m; young branches subterete, densely red-brown tomentose, becoming glabrate in age, with conspicuous lenticels, the older stems flattened and sometimes perforate. Leaves with the blade bilobed 1/4 to 1/2 the length, suborbicular, (8.1–)9–11 cm long, (6.6–)8–11 cm wide, 7- to 9-nerved, subcoriaceous, the lobes divergent, the lobe apex rounded, the blade base shallowly cordate,

the upper surface sparsely white-pilose, the lower surface short red-brown tomentose, especially on veins, usually glaucous, the petiole 2–6 cm long, red-brown tomentose, becoming glabrate with age, the stipules lanceolate to ovate, ca. 2 mm, red-brown tomentose. Inflorescence terminal or subterminal and axillary, in dense spiciform racemes, sometimes paniculiform, 8–15 cm long, red-brown tomentose; buds ovate, ca. 6 mm long, ca. 4 mm wide, red-brown tomentose, with 5 mucronate nerve tips extending ca. 0.5 mm beyond the apex, the pedicel ca. 1.5 mm long, the bract lanceolate, ca. 2 mm long, the bracteoles triangular-lanceolate, ca. 1 mm long; hypanthium cupulate, ca. 2 mm long, the inner surface sparsely red-brown tomentose near the base of the gynophore; calyx campanulate, ca. 4 mm long, strongly 5-nerved, the nerves extending 0.5–1 mm beyond the apex, conspicuously 5-lobed, the lobes triangular, the inner surface red-brown tomentose; petals white, broadly spatulate, 10–11 mm long, 4–5 mm wide, the claw ca. 3 mm long, glabrous, the blade concave, the apex emarginate, with short, red-brown trichomes along the top margin; stamens 12–13 mm long, the filament 10–11 mm long, glabrous, the anther oblong, ca. 2 mm long, glabrous; pollen spheroid, 3-colporate, the tectum microrugulate, with supracteal processes along the marginal ridges of the colpi; gynoecium 10–12 mm long, the gynophore ca. 2 mm long, red-brown appressed short-hirsute on the distal 1/2, the ovary ca. 4 mm long, appressed, short-hirsute, the style ca. 6 mm long, red-brown short-hirsute predominantly along the distal, ventral margin and the base. Fruit subelliptic, 6–10 cm long, 3.5–3.8 cm wide, slightly asymmetric, the apex acute with the oblique persistent style or style base, the valves coriaceous, conspicuously reticulate, glabrous or with a few appressed, red-brown trichomes near the gynophore, 1(–2)-seeded, the gynophore 1.5–2 cm long, appressed red-brown hirsute toward the base; seeds suborbicular, 8–12 mm long and wide, 0.5–1 mm thick.

Distribution and ecology.—Brazil (Minas Gerais and Rio de Janeiro). In moist forests at 0–700 m. Flowering in April and May.

This species is most closely related to *B. lilacina* and *B. trichosepala* from which it is easily distinguished by its white petals.

Specimens examined. **BRAZIL. Minas Gerais:** Viçosa, Agricultural College Lands, Campo Alegre, Alto de Samambaia, 685 m, 30 May 1930, *Mexia* 4772 (BM, G, P, US, WIS). **Rio de Janeiro:** Rio de Janeiro, 1849, *Armstrong* s.n. (K); Jun 1767, *Commerson* 201 (P); Rio de Janeiro, 1867, *Cunningham* s.n. (K); Estado do Guanabara, Morro de D. Marta, 4 Apr 1961, *Duarte* 5532 (K); s.d., *Endlicher* s.n. (P); Larangeiros, near Cosme Velho, 20 Apr 1867, *Glaziou* 1144 (P); s.d., *Glaziou* 3720 (K, P); Corcovado, 6 May 1873, *Glaziou* 6513 (G, K, P); Rio de Janeiro, s.d., *Graham* s.n. (K); s.d., *Lelande* s.n. (P); s.d., *Lépine* s.n. (P); s.d., *Loefgren* 1263 (P); Rio de Janeiro, s.d., *Miers* 3113 (K); Rio de Janeiro, s.d., *Miers* 3536 (K); Corcovado, s.d., *Miers* 4645 (K); s.d., *Nadeaud* s.n. (P); Rio de Janeiro, May 1832, *Riedel* s.n. (G); 1816–1821, *Saint-Hilaire* 804 (P); 1836, *Vauthier* 81 (K, P); 1836, *Vauthier* 149 (G, P); s.d., *Vauthier* s.n. (P); 1844, *Widgren* s.n. (US).

Bauhinia smilacina (Schott) Steud., *Nomencl. Bot.* ed. 2, 1:192. 1840. *Caulotretus smilacinus* Schott, in Sprengel, *Syst. Veg.* 16. 4(2):406. 1827. *Schnella smilacina* (Schott) G. Don, *Gen. Hist.* 2:459. 1832. TYPE: BRAZIL. RIO DE JANEIRO: s.d. (fl), *Schott* 5632 (LECTOTYPE, here designated: WI!; ISOTYPE: US!).

Woody, tendriled vine; young branches subterete, strigose, soon becoming glabrate, with “conspicuous lenticels, the older stems flattened, undulate, and sometimes perforate. Leaves with the blade entire, narrowly ovate to lanceolate, 5–8 cm long, 2.5–3.5 cm long, (3–)5(–7)-nerved, chartaceous to subcoriaceous, the apex acuminate to mucronate, rarely obtuse, the base subtruncate to rounded, the upper surface glabrous, slightly rugose, the lower surface with a few appressed trichomes toward the base, otherwise glabrous, slightly lighter in color than the upper surface, the petiole 7–15(20) mm long, with a few appressed trichomes or glabrous, the stipules obovate, ca. 1 mm long, glabrate. Inflorescence terminal or subterminal and axillary, in spiciform racemes, 3–10 cm long, red-brown strigose; buds elliptic-globose, ca. 3 cm long, ca. 2.5 cm wide, red-brown tomentose, the pedicel ca. 1 mm long the bract and bracteoles triangular-ovate, ca. 0.5 mm long; hypanthium depressed-cupulate, ca. 1 mm long, the inner surface sparsely red-brown pilose; calyx campanulate, 3–3.5 mm long, inconspicuously 5-nerved, the nerves not extending beyond the apex, 3-lobed, the lobes triangular, the inner surface sparsely red-brown strigose; petals white, spatulate, 6–7 mm long, 2–3 mm wide, glabrous, the claw 1–2 mm long, the blade concave, the apex rounded; stamens 5–7 mm long, the filament 4.5–5.5 mm long, glabrous, the anther oblong, 1.5–2 mm long, glabrous; pollen

spheroid, 3-colporate, tectum microrugulate, often microperforate, with depressed, spheroid supracteal processes; gynoecium 4–6 mm long, the gynophore ca. 1 mm long, red-brown short-hirsute on the upper part, the ovary ca. 1.5 mm long, red-brown short-hirsute, the style ca. 4 mm long, glabrous or with a few scattered, appressed, red-brown trichomes. Fruit narrowly elliptic, 6.5–7 cm long, ca. 1.5 cm wide, slightly curved, the apex with an oblique, persistent style base, the valves chartaceous, inconspicuously reticulate, sparsely appressed, red-brown short-hirsute, 1-seeded, the gynophore ca. 7 mm long, red-brown hirsute; seeds 15–16 mm long, 9–10 mm wide, 0.5–1 mm thick.

Distribution and ecology.—Brazil (Espírito Santo and Rio de Janeiro). In wet forest. Fruiting in August.

This species differs from the other two entire-leaved species, *B. poiteauana* and *B. maximiliani*, by its narrowly elliptic, chartaceous fruit which more closely resembles that of *B. microstachya*, to which it is apparently closely related. The fruits of *B. poiteauana* and *B. maximiliani* are reniform or elliptic-reniform and subcoriaceous.

Specimens examined. **BRAZIL. Espírito Santo:** Reserva Florestal de Sooretama, 10 Aug 1965, *Belém* 1537 (CEPEC, NY); Linhares, Refúgio Biológico Sooretama, 9–10 Aug 1965, *Lanna Sobo* 1056 (US, USF). **Rio de Janeiro:** near Rio de Janeiro, s.d., *Burchell* 1343 (K); near Rio de Janeiro, s.d., *Burchell* 1565 (K). Without precise locality: s.d., *Endlicher* s.n. (P); s.d., *Glaziou* 2554 (K, P); s.d., *Luschnath* s.n. (P).

Bauhinia trichosepala (L.P. Queiroz) Wunderlin & Eilers, comb. nov. BASIONYM: *Phanera trichosepala* L.P. Queiroz, *Neodivers.* 1:7. 2006. TYPE: BRAZIL. BAHIA. Ruy Barbosa, Serra do Orobó, trilha para o Pátio das Orquídeas, 12E 18°S, 40E 29°W, 8 Feb 2005, *D. Cardoso* 281 (HOLOTYPE: HUEFS; ISOTYPES: CEPEC, K).

Woody, tendriled vine; young branches subterete, red-brown tomentose, glabrate in age, with “conspicuous lenticels, the older stems flattened, undulate, often perforate. Leaves with the blade bilobed 1/3 to 1/2 the length, suborbicular, often broader than long, 4–8 cm long, 5–10 cm wide, 7- to 9-nerved, coriaceous, the lobes slightly divergent, the lobe apex rounded, the blade base deeply cordate, the upper surface usually tomentellous on the midvein and the pulvinus, otherwise glabrous, rugose, the lower surface red-brown tomentellous, especially on the nerves, subglaucous, the petiole 1–3.5 cm long, red-brown tomentose, the stipules linear, ca. 8 mm long, red-brown tomentellous. Inflorescence terminal or subterminal and axillary, in spiciform racemes, 15–20 cm long, red-brown tomentose; buds elliptic-ovate, 1–1.5 cm long, ca. 1 cm wide, red-brown tomentose, 5-angled toward the base, undulate-winged toward the apex, each wing ending in a twisted, setaceous tip 3–5 mm long, the pedicel 2–3 mm long, the bract and bracteoles linear, 8–10 mm long; hypanthium cupulate, 2–3 mm long, the inner surface glabrous; calyx campanulate, 8–9 mm long, conspicuously 5-nerved, irregularly splitting to half the length into 2 lobes, the lobes triangular, the inner surface red-brown strigose; petals bright pink, spatulate, 2.5–3 cm long, 0.7–1.4 cm wide, the claw ca. 5 mm long, glabrous, the blade elliptic-ovate, the apex rounded, the margin slightly crisped, red-brown tomentellous toward the apex on the outer surface; stamens 2–2.5 cm long, the filament 1.5–2 cm long, glabrous, the anther oblong, 3–4 mm long, glabrous; pollen spheroid, 3-colporate, tectum microrugulate, often microperforate, with spheroid supracteal processes on the marginal ridges of the colpi; gynoecium 22–25 mm long, the gynophore ca. 4 mm long, sparsely red-brown tomentellous distally, the ovary ca. 5 mm long, sparsely red-brown tomentellous toward the base and along the ventral margin, the style ca. 14 mm long, glabrous. Fruit (immature) elliptic, 8.5–9.5 cm long, 3–3.5 cm wide, glabrous, 1-seeded, the gynophore ca. 2.5 cm long, glabrous; mature seeds not seen.

Distribution and ecology.—Brazil (Bahia and Minas Gerais). In caatinga seasonally dry forests at 800–1,000 m. Flowering February to May; fruiting April to July.

A distinctive species and one of two taxa of section *Schnella* with non-white flowers. It is distinguished from *B. lilacina*, its most closely related species, by its larger petals (25–30 mm long vs. 13–15 mm long in *B. lilacina*), its undulate winged sepals elongated into conspicuous setaceous tips, and its glabrous style.

Specimens examined. **BRAZIL. Bahia:** Encruzilhada, margin of the Rio Pardo, 23 May 1968, *Belém* 3598 (CEPEC); Ibotirama, 14 Apr 1971, *dos Santos* 1592 (CEPEC); KM 20 on highway from Conquista to Barra do Choça, 19 Feb 1973, *dos Santos* 2576 (CEPEC); 27 km SE of Morro do Chapéu on highway BA052 to Mundo Novo, ca. 800 m, 4 Mar 1977, *Harley et al.* 19397 (K, US). **Minas Gerais:** Serra da Alegria, near Caraças, s.d., *Glaziou* 14623 (K, P).

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REFERENCES

- BRITTON, N.L. and J.N. ROSE. 1930. Caesalpinaceae. N. Amer. Fl. 23:201–349.
- HAO, G., D.X. ZHANG, M.Y. ZHANG, L.X. GUO, and S.J. LI. 2003. Phylogenetics of *Bauhinia* subgenus *Phanera* (Leguminosae: Caesalpinioideae) based on ITS sequences of nuclear ribosomal DNA. Bot. Bull. Acad. Sci. 44:223–228.
- LEWIS, G.P. and F. FOREST. 2005. Tribe Cercideae. In: G. Lewis, B. Schrire, B. Mackinder, and M. Lock. Legumes of the world. The Royal Botanical Garden, Kew. Pp. 57–67.
- VAZ, A.M.S. DA F. and H.C. DE LIMA. 1986. *Bauhinia smilacina* (Schott) Steudel (Leg. Caes.)—uma espécie pouco conhecida do Estado do Rio de Janeiro. Atas Soc. Bot. Brasil, Secc. Rio de Janeiro 3:69–75.
- WUNDERLIN, R.P., K. LARSEN, and S.S. LARSEN. 1987. Reorganization of the Cercideae (Fabaceae: Caesalpinioideae). Biol. Skr. 28:1–40.